IN THE SPECIFICATION:

Please amend paragraph number **[0001]** as follows:

[0001] This application is a continuation of application Serial No. 09/694,113, filed October 20, 2000, ~~pending.~~now U.S. Patent 6,685,080, issued February 3, 2004.

Please amend paragraph number **[0003]** as follows:

[0003] State of the Art: Integrated circuit semiconductor devices (~~IC's~~ICs) are small electronic circuits formed on the surface of a wafer or other substrate of semiconductor material such as silicon, gallium arsenide or indium phosphide. The IC devices are fabricated simultaneously in large numbers in wafer form in an array over the active surface of the wafer and tested by a probe to determine electronic characteristics applicable to the intended use of the ~~IC's~~ICs. The wafer is then subdivided or "singulated" into discrete IC chips or dice, and then further tested, assembled with other components and packaged for customer use through various well-known individual die IC testing and packaging techniques, including leadframe packaging (conventional and leads-over-chip, or LOC), Chip-On-Board (COB) packaging, and flip-chip packaging. Depending upon the relative die and wafer sizes, each wafer is singulated into at least a few dozen dice, as many as several hundred dice, or even as many as several thousand discrete dice when large (such as 30 cm) wafers are employed.

Please amend paragraph number **[0015]** as follows:

[0015] Single-ball pickup heads are known in the art for the purpose of placing solder balls on conductive pads of a workpiece. An example of such is described in U.S. Patent No. 5,506,385 to Murakami et al. in which vacuum is used to hold a solder ball on a tubular pickup head. While sometimes useful where the number of solder balls on the workpiece is few, its use in forming multi-ball ~~BGA's~~ BGAs is contraindicated, being generally very slow, labor-intensive, and expensive. In the Murakami et al. reference, the apparatus uses a spring-biased head which holds a single solder ball, picked up from one of a series of containers

holding balls of differing sizes. Flux is applied to each pad, followed by application of a solder ball and thermal reflow resulting from a laser beam focused on the ball.

Please amend paragraph number **[0017]** as follows:

[0017] Solder balls installed on the workpiece may be defective in various ways. For example, a ball may be ~~undersize~~ undersized (and, thus, not be adequately connected to both a die and the carrier substrate during bonding), or the ball may be ~~oversize~~ oversized (and prevent other adjacent balls from being adequately bonded to the carrier substrate or spread to contact an adjacent ball). The solder ball may also be irregular in shape, resulting in defective bonding. In addition, a solder ball may contain a surface inclusion which prevents or inhibits proper reflow. A solder ball may also be misaligned with its pad, resulting in defective contact therewith. In the current state of the art, such defects are simply dealt with by removing all of the solder balls on a given workpiece and starting over. The "repair" is thus very time-consuming, material-consuming and expensive. None of the above-indicated references appear to recognize or address such problems.

Please amend paragraph number **[0020]** as follows:

[0020] The use of flip-chip technology with solder balls has numerous advantages for interconnection, as compared to conventional leadframe type packages. Flip-chip provides improved electrical performance for high frequency applications such as mainframes and computer workstations. In addition, easier thermal management and reduced susceptibility to electromagnetic interference (EMI) and radiofrequency interference (RFI) emissions are inherent. Furthermore, small solder balls may be densely packed in a BGA array within the footprint of a semiconductor die, which approach conserves surface area ("real estate") on a carrier substrate and permits a greater number of dice to be placed on a substrate while providing a number of ~~I/O's~~ I/Os for each die well in excess of that achievable using leadframes.

Please amend paragraph number **[0067]** as follows:

[0067] In FIG. 5, a particular solder ball 50A has been identified as being undersized. The ~~central~~ vertical axis 32 of a capillary tube 42 of a ball pickup head 20 is aligned with the ball 50A. With the vacuum on, the capillary tube 42 is lowered to place the capillary tube end 44 on the defective ball 50A where the ball is attracted to the capillary tube end 44. The heater 90 (see FIG. 4) is activated to soften (e.g., melt) and detach the defective ball 50A from attachment site 62A as shown in FIG. 6. In one embodiment, a slight upward biasing force may be applied to the capillary tube 42 away from the attachment site 62A to facilitate release of a heat-softened solder ball 50A from the attachment site 62A, the capillary tube 42 and vacuum-held softened solder ball 50A then retracting slightly from attachment site 62A. Such a retraction mechanism may be in the form of a spring-loaded solenoid of which capillary tube 42 forms a part, the solenoid being powered to overcome the retractive force of the spring until retraction of a solder ball 50A is desired. Alternatively, a spring may be used to extend the capillary tube 42 until it is desired to retract the same when the solenoid is powered.